Using Information in Clinical Practice: A Pediatric Asthma Case Study

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Goals

- Describe key epidemiological features of childhood asthma
- Describe how evidence derived from population based studies may improve care to individual patients, small groups, or entire communities
- Describe the current limitations of current process and outcome measurement systems

Epidemiology- What does a clinician really want to know?

- Prevalence, and how that was determined- doctor diagnosis, community survey, patient report
- Distribution of severity (risk factors)
- What portion is under a clinician's control (contrast immunization to prevent meningitis with installation of fences to prevent drowning).

Other Epidemiology Related Concepts

- Catchment areas
- Small area variation (Wennberg et al)
- Not necessarily due to over or under utilization or poor clinical practice
- Health Services Research
- Performance Measurement

Background- DoD Asthma Project

- 1992 direction by the principal Assistant Secretary of Defense for Health Affairs (ASDHA) to implement Clinical Practice Guidelines
- Asthma chosen for two reasons- high volume and availability of national clinical practice guidelines
- Civilian External Peer Review modified to assess guideline adherence and risk adjusted outcome

DoD Asthma Epidemiology- Key Features

- Hypothesis- asthma should be less prevalent in DoD since asthma is a potential disqualification for military service
- In 1994 asthma was the most common pediatric reason for admission
- 1994 admission rate comparable to US average
- Therefore asthma more severely affected DoD beneficiaries (more admissions for fewer patients)

DoD Asthma Epidemiology

- Point prevalence now more accurately estimated
- 6% based on Region 6 HEAR survey
- 3-5% based on ADS data from Army sites (more complete survey in progress
- US figures vary 6-7%
- Conclusion: asthma no more prevalent in DoD than US population at large, perhaps less prevalent

DoD Asthma Severity and Risk Factors

- Major demographic risk factors are age, race and sex
- Breath or speech limiting attacks (which might mean ED treatment do correlate, although poorly, with frequency of attacks and nighttime episodes)
- A history of seeking treatment for flares predicts the same

What Outcome Measures to Choose

- Serious flares or surrogates (ED visits, admissions)
- The converse (patients who have neither)
- Functional status (valid measures available)
- Economic measures (lost work, lost school)

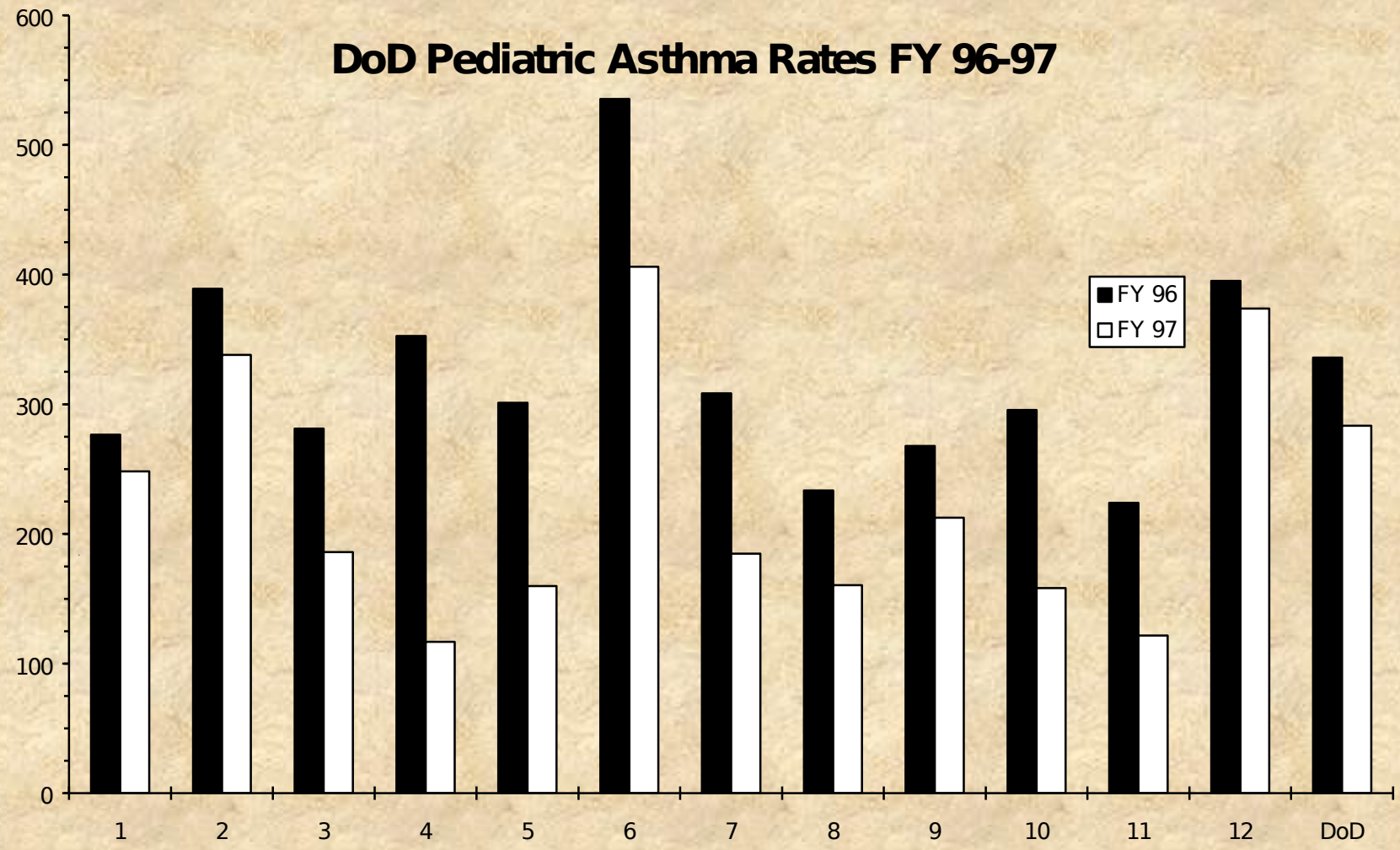
Why is discharge rate an important measure for asthma (The granddaddy of them all)?

- (Discharge rate is essentially the same as admission rate but technically more correct since coding occurs at discharge)
- Relatively easy and fast to measure.
- Relatively accurate
- Measure serves several roles well: surrogate for resource consumption, patient functional status (many patients have multiple admissions) and health plan performance.

DoD Methods- Discharge Rates

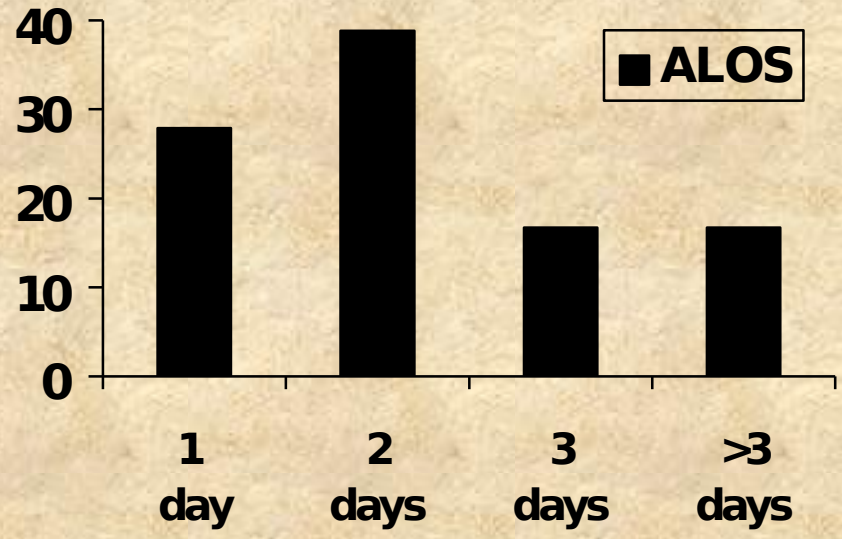
- Central database repository (RCMAS) for hospital discharge and demographic data. Combined with DEERS data to construct catchment areas
- Includes data from direct care and CHAMPUS
- Able to describe regional rates and DoD centers with highest number of discharges
- No validation of database
- Stratification by age, race, and sex (clinically relevant) is possible

Discharge Rates



Population Based Evidence Can Improve Care of Small Groups

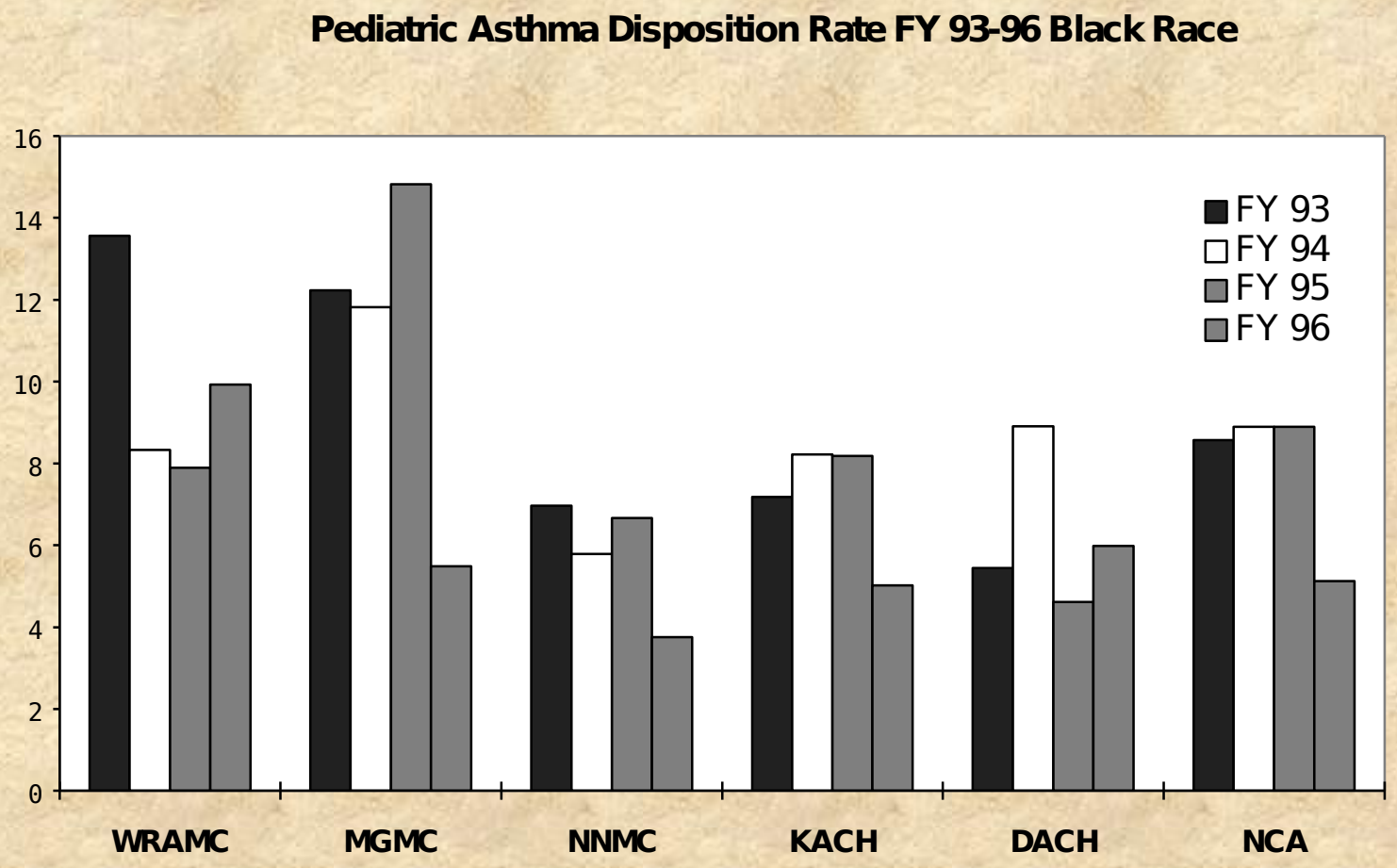
- Example: average length of stay of 2 days for pediatric asthma hides two groups
- One group likely would benefit from observation unit
- Other group has prolonged O2 requirement, at risk for atelectasis and repeat episode with same



Population based studies may improve care to entire communities:

- MGMC identified as NCA MTF with most asthma admissions in FY 94
- Zip code analysis of admissions revealed many lived on base (±30%)
- Above considerations lead to pilot specialist directed clinic at MGMC in FY 96 (Sutton's law)
- Overall reduction in asthma admissions by greater 50%

Risk Factors May Change with Intervention- Note Decrease in Admission Rate for Blacks at MGMC



Performance measurement-simple to complex

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- describe the effect of some intervention on a specific group of patients- “outcome study”
- change in “outcome” associated with change in process- pre and post quality improvement
- comparison of multiple provider groups (health plans, MTFs)

Methods-Clinical Practice Patterns

- Focused chart review at 11 MTF's (5 Army 3 Navy 3 Air Force)
- ED portion 100 encounters per site, random sample, Fall of 1993 (1 Sep- 31 Dec 1993)
- Hospital sample all admissions Fall 1993
- Focused chart review using NHLBI criteria with minor modifications

Demographics - ED (1003 episodes)

- Age < 5 35%
- Male sex 65%
- Black race 25%

Patient History - ED (1003 episode)

- Duration of Sx 38 hrs
- URI noted as a trigger 53%
- Smoke exposure- not addressed 95%
- Nocturnal symptoms reported 11%
- ED visits in last 12 months 22%

Current Medications- ED (n=1003)

- Bronchodilator 73%
- Cromolyn/nedocromil 17%
- Inhaled steroids 13%
- Theophylline 5%

Risk Factors ED (n=1003)

- Previous intubation 2%
- Premature birth 3%
- Steroid dependent 0.3%

Treatment - ED (n=1003)

- Time to be seen 32 min
- Time in ED 150 min
- Time to first neb 45 min
- Systemic Steroids 49%
- Anticholinergics 3%
- IV aminophylline 0.4%

Assessment - ED (n=1003)

- Wheezing 78%
- Pulse ox <91% 9%
- ABG 4%

How Does This Information Help the Clinician in Everyday Practice?

- Is this going to happen again to me or my child? (ED, admission)
- Answer: yes- 9% chance of admission in next 4 months if seen in ER, 16% chance if admitted CEPRA FY 1994
- Can I go overseas? See above. Risk returns to average only after 2 years admission free.

How Does This Information Help the Clinician in Everyday Practice?

- Is my child likely to die? (ED, admission)
- Answer: very unlikely no deaths in first two years of study (n>2000)

How Does This Information Help the Clinician in Everyday Practice?

- Is my child likely to outgrow this? (ED, admission)
- Answer: risk of admission (read serious problems) drops steadily with age.